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PRIEST RIVER EXPERIMENTAL FOREST

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1969 ANNUAL REPORT

Priest River Experimental Forest
Priest River, Idaho

by

Calvin L. Carpenter

Distribution:
Ogden
Wellner
Copeland
RWU 1201
RWU 1601
RWU 2303
MFEL
Kaniksu SO
Falls RS
PREF

Intermountain Forest and Range Experiment Station
Ogden, Utah

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INTRODUCTION

The Priest River Experimental Forest completed its 58th year of continuous operation in 1969. The following report summarizies the activities and accomplishments during this final year of the "Sixties".

RESEARCH ACTIVITIES

Timber Management Research

Among the 1969 management operations on the Experimental Forest that are aimed at providing conditions for future silvicultural study installations were the planting and direct seeding of several species (in various composition and density comparisons) in the upper Benton Creek clearcut areas. Examinations of seed germination and seed and seedling losses in the direct-seeded unit were made during the spring in protected and unprotected plots to help determine causes of success or failure.

Some operational thinning by Experimental Forest personnel was begun in the young natural stand that occupies a small area adjacent to the white pine vigor-quality study site.

Genetics Research

Scheduled remeasurements were made in the "vigor-quality" outplantings of western white pine near the lower end of ~~Smith~~ South Ridge road. These plots were established in 1955 to determine heritability of certain growth traits in progeny of partly rust-resistant parentage.

Watershed Management Research

Benton Creek Model Watershed

RMU 1601's major accomplishment during the past season was to complete the "south slope" replication of the study entitled, "Effects of timber harvest on changes in snow water equivalent." Instrumentation at all eight stations was activated November 1, 1969. Melt data from the four "north slope" stations gathered during the 1969 snow season were very revealing. As part of the study, nine snow courses are to be measured during the coming 1970 winter season.

To improve the efficiency of data collection during the winter and to provide an emergency stop-over in case of accident, an overnite cabin was constructed near the Upper Benton Springs. Heated and lighted by propane gas, the shelter provides overnite sleeping and cooking facilities for four men. Modern sanitation facilities were also installed. Being well exposed at the edge of the 75-acre clearcut, it was paramount that the structure blend into the landscape. It does just that in a very pleasing manner. Crews will be staying over one or two nights each week later in the winter season at the peak of the work load.

Cooperative Studies with Universities

RWU 1601 and Washington State University continued the project which was initiated in 1965 to gain information on snow interception and evaporation in crowns of several coniferous species. In addition to this, a new study was begun that involves elevation-frequency analyses of cloud-engulfed forests in mountainous terrain. Principal investigator is Dr. Donald Satterlund.

Under the direction of Dr. George Belt, RWU 1601 and the University of Idaho began a study concerning winter radiation balance in coniferous forests.

Forest Disease Research

The natural inactivation plot established in June 1967, by RWU 2303, near the V-Q plot along the South Ridge road as a part of Study 2303-91 was measured in September 1969. At that time 10 pairs of trees were treated as a supplement to study 2303-116. One tree of the pair was one of the trees used in the inactivation study and was left untreated; the other tree was pruned by removing the lower one-third of the crown (based on tree height) and all blister rust-infected branches in the unpruned portion of that crown.

The Experimental Forest Superintendent completed microscopic examination of 2500 remaining dwarfmistletoe-infected branch sections that had been collected from plots on the Colville National Forest last year.

Irrigation and weed control work in the nursery site was accomplished as needed by Experimental Forest seasonal employees. The nursery area is presently occupied by plantings of several tree species being used in tests of host specificity and age susceptibility to dwarfmistletoe infection, and by planted white pine seedlings that will be used in future study of blister rust/*Tuberculina maxima* relationships.

Dr. Ronald Peterson (University of Tennessee), James Dodd (his assistant), Paul D. Alexio (Kalamazoo College, Kalamazoo, Michigan), and M. A. Donk (The Hague, Netherlands), occupied the messhall-bunkhouse during the first 10 days of October, while collecting mushroom fungi. Laboratory facilities were also utilized by the group for drying, analyzing, and photographing specimens.

Forest Insect Research

In 1967, a larch casebearer study was begun to determine the effects of repeated western larch defoliation. Follow-up examinations of malathion-sprayed and untreated trees were made in 1969.

Wildlife Habitat Research

The 2½-acre tract on the Priest River flat logged in 1967 for a wildlife habitat improvement study was finally prescribe-burned in the fall of 1969. Calorimeter cans were used to measure the intensity of burn achieved.

Forest Influences

Control Weather Station

Temperatures at the control station near the headquarters during 1969 followed average trends quite closely, but while total precipitation for the year was near average, precipitation for the July-November period ran a third less than normal (Table 1). Highlights of these climatic records, the most complete of those for any forested area in the state of Idaho, are publicized weekly and monthly in local news media. Numerous requests for specific data were received from other agencies and private individuals.

Cumulative precipitation for the 1968-69 "water-year" is graphed in Figure 1, together with the comparative trends for the wettest year, driest year, and a 50-year mean.

Other long-term records of precipitation have been kept at Benton Dam and Benton Spring. Monthly totals for the three stations for 1969 and for the past decade are presented in Table 2.

Fire Weather Station

In conformity with the National Fire Danger Rating System, daily observations were made during the regular season, which begins May 1 and continues through October 31. The fire weather is relayed by telephone or radio communication to the Falls Ranger Station daily and the regular 10-day reports are mailed to the fire dispatcher at the Supervisor's Office in Sandpoint, Idaho.

Snow Survey

The Benton Spring and Benton Meadow snow courses were measured monthly by Experimental Forest personnel from January through May 1969 (Table 3). This activity is conducted in cooperation with the Soil Conservation Service.

Table 1. Control station monthly precipitation and temperature, 1969. Figures in parentheses are 50-year (1912-1961) averages

Month	Precipitation	Temperature	
		Ave. max.	Ave. min.
	Inches	Degrees F.	
January	6.78 (4.02)	23.7 (30.3)	13.3 (16.6)
February	2.06 (3.09)	34.7 (36.9)	19.4 (18.3)
March	1.07 (2.65)	46.9 (45.3)	22.9 (23.5)
April	3.39 (2.04)	55.1 (57.6)	31.5 (29.6)
May	2.89 (2.18)	69.2 (66.7)	39.6 (36.6)
June	2.24 (2.27)	75.1 (73.5)	47.1 (42.5)
July	0.80 (0.89)	78.5 (83.1)	44.1 (45.5)
August	Trace (0.97)	81.6 (80.2)	41.3 (43.4)
September	2.98 (1.67)	70.2 (70.9)	41.9 (37.8)
October	1.55 (2.96)	52.6 (56.6)	31.5 (32.1)
November	1.94 (3.76)	39.8 (39.6)	27.2 (26.7)
December	4.15 (4.37)	32.0 (32.5)	26.2 (21.1)
Annual	29.85 (30.87)	55.0 (56.1)	32.1 (31.0)

FIG. 1--CUMULATIVE PRECIPITATION FOR WATER YEAR, OCTOBER THROUGH SEPTEMBER
PRIEST RIVER EXPERIMENTAL FOREST, CONTROL WEATHER STATION

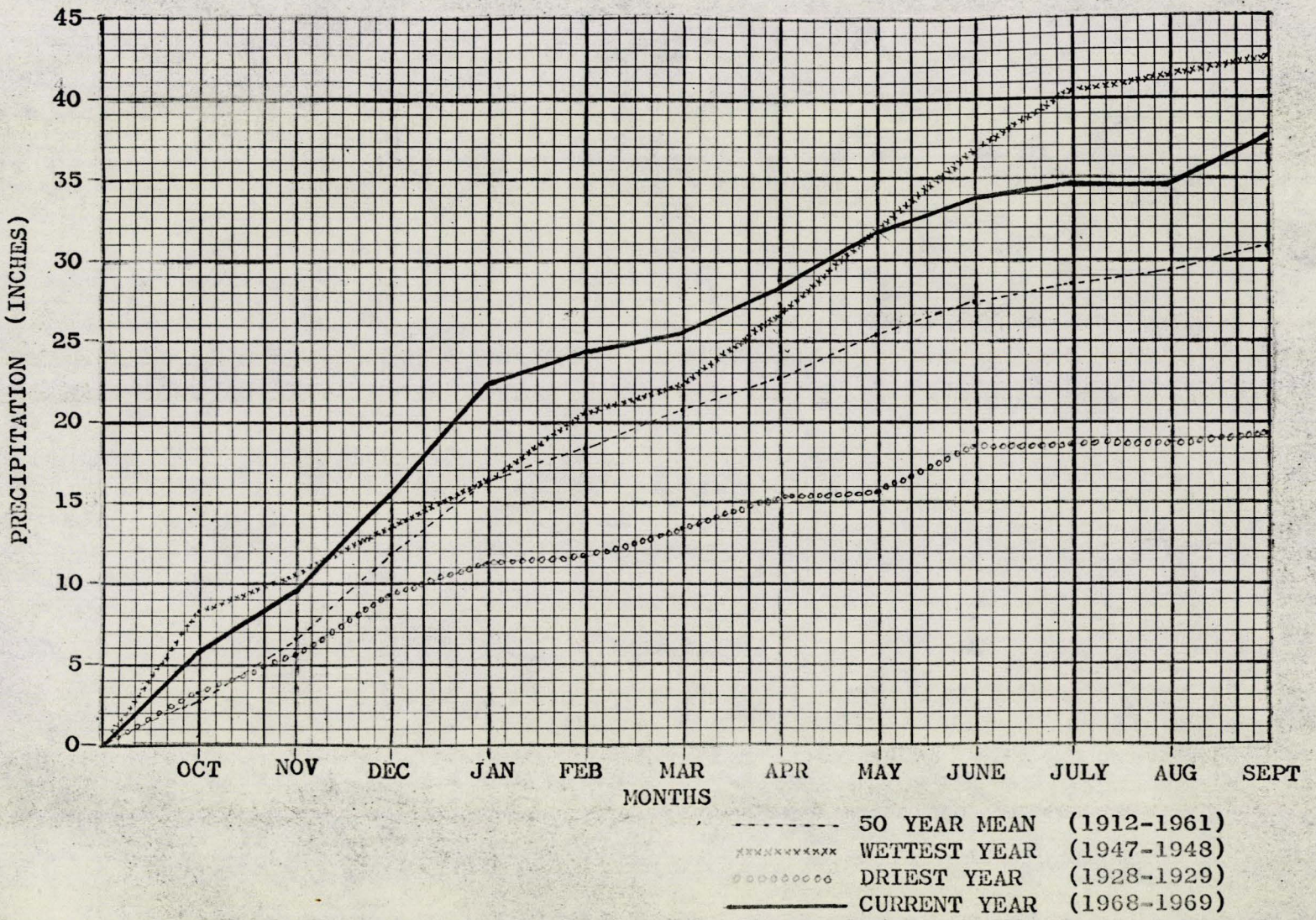

Table 2. Precipitation at 3 stations on Benton Creek. Figures in parentheses are 10-year (1960-1969) averages.

Month	Control Sta. (Elev. 2344')		Benton Dam (Elev. 2640')		Benton Spring (Elev. 4700')	
	Inches					
January	(.78	(4.37)	7.31	(5.21)	8.30	(4.22)
February	2.06	(2.64)	2.38	(2.81)	3.20	(3.14)
March	1.07	(3.01)	1.21	(3.21)	1.40	(3.59)
April	3.39	(2.04)	3.39	(2.23)	4.30	(2.75)
May	2.89	(2.58)	2.85	(2.65)	3.50	(3.40)
June	2.24	(2.05)	2.54	(2.22)	3.70	(2.66)
July	0.80	(0.78)	0.90	(0.81)	1.30	(1.00)
August	0.00	(1.38)	0.00	(1.63)	0.00	(1.72)
September	2.98	(1.52)	3.03	(1.47)	2.50	(1.45)
October	1.55	(2.63)	1.48	(2.49)	2.90	(2.78)
November	1.94	(4.90)	1.78	(5.03)	1.60	(4.99)
December	4.15	(4.51)	4.37	(5.15)	4.70	(5.31)
Annual	29.85	(32.41)	31.24	(34.91)	37.40	(37.01)

Table 3. Snow depth and water content at Benton Meadow and Benton Spring snow courses, 1969. Figures in parentheses are 27-year (1937-1961) averages.

Date	Benton Meadow (Elev. 2344')				Benton Spring (Elev. 4775')			
	Snow depth		Water content		Snow depth		Water content	
	Inches							
January 1	22.4	(12.0)	3.6	(2.7)	36.9	(30.9)	9.1	(8.4)
February 1	54.2	(19.4)	10.3	(4.8)	67.4	(46.8)	18.3	(13.7)
March 1	36.9	(19.3)	12.0	(6.0)	67.2	(55.3)	23.3	(18.4)
April 1	16.5	((6.2)	7.2	(2.3)	59.6	(55.6)	23.0	(20.4)
May 1	0.0	(0.0)	0.0	(0.0)	37.2	(34.0)	15.2	(14.8)

Other Climatic Stations

As noted in the 1968 Annual Report for this Experimental Forest there were 15 other instrumented stations located within the "Model Watershed," serviced weekly as a part of the program of the WWR unit at Moscow.

ADMINISTRATIVE ACTIVITIES

Fire Protection

Annual review of the fire plan was made and found to be satisfactory. The contents consist of the applicable portion of the Falls District plan, the outline of the Experimental Forest responsibilities, and provides an action plan for the headquarters area.

On June 12 at approximately 2030, a fire was reported burning within the boundary lines of the Experimental Forest. The fire was spotted by Earl Smith, who was piloting the Priest Lake Timber Protective patrol plane. The lightning-caused fire was located in portions of sections 19, 20, 29 and 30 T 56 N, R 3 W within the Upper Benton clearcut (Unit C). It burned over a 30-acre area which had been prescribe-burned in the fall of 1968 and planted in the spring of 1969. Initial attack was made by Larry White and Dick Brown from the Falls Ranger District, and Cal Carpenter, PREF. It is planned to replant the reburned portion in 1970.

Forest Roads

Appropriate funds were made available in September for some new road construction and reconstruction work on the Experimental Forest. Following is a resume of accomplishments:

South Ridge road - 2 mi. reconstructed.
M3 - 3700' of new road.
M4 - 5700' of new road.
K8 - 900' of new road.
L1 - 2700' of new road.
L2 - 2000' of new road plus reconstruction of the previously existing portion.
L3 - 1300' of new road plus reconstruction of the previously existing portion.

Salaries, Mileage and Forest Equipment	$13,143.50
Arch Pipe Culvert (Benton Creek)	1,160.50
Equipment rental	12,068.00
Total	$26,372.00

The above costs include explosives, road grading, saw repair, and installation of open-top culverts on South Ridge road. Scarified areas at road take-off points were sowed with grass seed furnished by the Kaniksu National Forest.

Ron MacDonald completed road maintenance in the Lower Canyon Creek sale area and on access roads, in accordance with the 1965 timber sale contract.

Timber Sales

North Fork Big Creek (Aug. 8, 1969-Peterson Bros.).--This sale was made to open new study sites for the watershed research project, consisting of two small clearcut strips on the Big Creek side of South Ridge in the Experimental Forest. Silvicultural objective for both strips is natural regeneration of mixed species.

Lower Canyon Creek Salvage (Sept. 29, 1969-Merritt Bros. Lumber Co., Inc.).--This was a pulp salvage sale aimed at better clean up of the area and better utilization of material. About 140 MBF of sawlogs and pulplogs, 4 cords of cedar shakes, and 2100 cedar posts were involved. The area is scheduled for slashing, dozer piling, burning, and planting, with K-V funds already collected from original sawlog sale.

Lower Benton Creek Salvage (Oct. 9, 1969--Don Clary).--An estimated 1900 cedar posts were to be salvaged from within the previously logged-over area.

Improvements and Maintenance

The customary semi-annual samples of culinary water were submitted to the Idaho State Health Department for analysis. No contamination was found.

The sewer system proved to be satisfactory throughout the year. The periodic maintenance checks, which were proposed the prior year, were followed up, including the removal of brush and other vegetation along the banks of the lagoon and discharge line.

Maintenance of the headquarters grounds area included stump removal and backfill, irrigation, mowing lawns, weed control, tree pruning, trash burning. The summer application of calcium chloride again greatly relieved the dust problem created by traffic in the headquarters road system.

Building maintenance performed in 1969:

(a) Office: Leakage in the main water supply line and sub-zero temperature causing drain clog, resulted in water back-up into the cold water system. Some subsequent repair of lines was needed. All exterior trim was refinished during the summer season.

(b) Bunkhouse-Messhall: Reroofing with green, galvanized, 28-gage steel material, including removal of deactivated flue, was completed in July. Damage in the upstairs sleeping quarters resulting from defective chimney flashing was repaired and a new standpipe was installed over the outside water main shutoff.

(c) Cottage #1 (Lodge): All exterior trim was refinished, and varnishing of interior trim was completed. Minor roof repair was made, and the fuel feed line in the heating system was modified to remedy excessive sediment buildup that caused malfunction in the burner nozzle. Two aluminum storm doors were installed, and a wall was repaired in the downstairs bathroom.

(d) Cottage #2: Installed a new roof of green, galvanized, 28-gage steel material and laid wall-to-wall indoor-outdoor carpet in the living room. Exterior trim was refinished, and minor improvements were made in the heating system.

(e) Cottage #3: The exterior trim was refinished, heating system modified, and minor plumbing repair was accomplished.

(f) Cottage #4: The exterior trim was refinished, heating system modified, the master bedroom, guest bedroom, and living room were refinished. A new hot water heater was installed, and minor plumbing repair was necessary.

(g) Shop: The old "blacksmith" shop (the west portion of the work shop) was repainted and an underground pipe was installed to supply propane fuel from the 100 gal. tank at the messhall to the propane heater in the shop work area. Two 220-volt outlets, one for the electric welder, and one for the radial arm saw, were set up to improve conditions in shop.

(h) Gas and Oil Storage: Installation of an electric gasoline pump, as well as fire- and weather-proof lighting, was completed in July.

(i) Three cubic yards of top soil was acquired for the purpose of backfilling as needed in lawns and around building foundations.

(j) Regular monthly inspections were conducted throughout the year.

Personnel

Local Employees

Position	Dates	Name
Superintendent	1/30/65-present	Cal Carpenter
Forestry Res. Tech.(WMR)	8/19/64-present	Bud Jeffers
Forestry Aid (WMR)	Intermittent	William Manly
Forestry Aid (WMR)	1/13/69-5/2/69	Richard Brown[1/]

1/ On loan from the Falls Ranger District to assist RWU 1601 with the extra work load through the winter months.

Position	Dates	Name
Maint. Asst.	Intermittent	Jane Knoke
Maint. Asst.	6/9/69-9/20/69	John Bonez 2/
Maint. Asst.	Intermittent	Roger Booth 2/

2/ Employed as summer trainees under the Youth Opportunity Campaign.

Meetings and Inspections

Mar. 18-19, 1969	A Watershed Management meeting, including a seminar and field tour; attended by Harold Haupt, Ned Bethlahmy, Walt Megahan, H. W. Berndt, W. B. Fowler, Glen Klock, Don Satterlund, George Belt, John Herbst and Bud Jeffers.
May 5, 1969	Meeting on site preparation methods; attended by B. Bemfait, B. Fischer, G. Deitschman, D. Leaphart, R. Hungerford, Dallard Johnson, Dick Deden, Lloyd Swanger, Ted Kardos, Skip Newton, and Cal Carpenter.
May 20, 1969	Examination of 10-acre direct seeding, exclosure installations, rodent trapping, and bait treatment; Andy Eatman, Ray Boyd, Pat O'Conner and Cal Carpenter.
July 25, 1969	GFI (WMR) tour of the Benton Watershed; S. Trotter, Paul Bather, George Smith, Lloyd Swanger, Skip Newton, Harold Haupt
Aug. 5, 1969	Headquarters buildings and grounds inspection; Ben Plowgian, Robert Enny, Cal Carpenter.
Oct. 13, 1969	Inspection of proposed North Ridge Timber Sale cutting plan and road layout; M. Foiles, Ted Kardos, Don Omm, Cal Carpenter.
June and Oct.	Headquarters control station and Benton Streamgaging dam, station, recording rain gages, max.-min. thermometers, etc.; checked by Norman Wolcott (U.S.W.B., Boise).
Oct. 28	Annual meeting with Falls Ranger Sta.; Lloyd Swanger, Ted Kardos, Skip Newton, Larry White, Roy Wise, Dallard Johnson, Dick Deden, Ben Plowgian, Glenn Deitschman, Marvin Foiles, Cal Carpenter, Harold Haupt, Ned Bethlahmy, and Bud Jeffers.

Official Visitors

Dates	Visitors	Purpose of Visit
Jan., Feb., Mar.	Boyd Hill (WSU)	Assist with snow interception studies.
Feb. 13-14	George Belt and John Herbst (U of I)	Snow interception and evaporation studies.
Apr. 7	Don Satterlund (WSU)	Supervise and inspect snow interception study.
May 24-25	Dr. Daubenmire and 30 students in field ecology class (WSU)	Field observation of ecological communities and research activities at PREF.
June 2-6 June 10-23	Robert Hursey (U of I)	Field study and research relative to Ph.D. dissertation problem.
June to Aug.	Ted L. Esslinger (U of I)	To conduct a study of corticolous lichens in association with habitat types.
June 9-18	C. M. Norman F. W. Campbell Patrick Owens (U of I)	Decay studies being conducted under direction of Art Partridge, Univ. of Idaho.
June 20	(see below)	Habitat-type training

L-R: Daubenmire, Boyd, Dedam, Foiles, Kardos, Chehok, Summerside, Rehfeldt, Kalbaugh, Swanger, Steinhoff, Olson, Brown, Weistamer, Coffen, Carpenter, Deitschman (photographer)

Date	Visitors	Purpose of Visit
Aug. 22	Harold Anderson, Lloyd Swanger (Kaniksu)	Observation of timber cutting activity on the Exp. Forest.
Sept. 24	Dr. Alvin Aller and 17 students in ecology class (U. of I.)	Field observation of ecological communities and research activities at PREF.
Oct. 1-9	Dr. Ronald Peterson (Univ. of Tenn.)	Collection and study of higher fungi.
Oct. 1-9	Paul Alexio (Kalamazoo College)	"
Oct. 1-9	James Dodd (Univ. of Tenn.)	"
Oct. 1-9	M. A. Denk (The Hague, Netherlands)	"
Nov. 11-13	George Belt	Project inspection and advisory consultation in connection with coop. study associated with winter radiation balance.
Dec. 10-11	George Belt, Richard Johnson, Aziz Ahaved	Show-me tour of study sites at PREF.

Cooperation

The Kaniksu National Forest provided its customary assistance and technical advice with regard to administrative operation of the Experimental Forest. The Falls Ranger District administered timber sales, road layout, and participated in the management activities associated with research. The regular annual meeting with the District was held at the PREF headquarters October 28. Members of the District staff attending were Lloyd Swanger, Ted Kardos, Skip Newton, and Larry White. The Supervisor's Office of the Kaniksu National Forest was represented by Roy Wise, Dallard Johnson and Dick Deden. Experiment Station representatives were Ben Plowman, Glenn Deitschman, Marvin Foiles, Cal Carpenter, Harold Haupt, Ned Bethlahmy, and Bud Jeffers. The main topics discussed were: the memorandum of understanding (subsequently updated), timber sales, five-year plan, site preparation, planting, roads, and miscellaneous items. Ranger Lloyd Swanger and members of his staff are to be commended for their efforts to reach mutual understanding and for their very constructive attitude toward implementing needed operations on the Experimental Forest.